What is claimed is:

1. An optical monitor, comprising:

a tunable filter for filtering a tapped portion of an optical signal at a predetermined frequency;

a directing means for directing the filtered optical signal back through the tunable filter; and

a single photodetector for measuring the power of said filtered optical signal.

2. The optical monitor of claim 1, further comprising an optical coupler for tapping a portion of the optical signal, wherein said filtered optical signal is directed back through the tunable filter and the optical coupler by said directing means.

3. The optical monitor of claim 2, wherein said optical coupler comprises a 5/95 optical coupler.

4. The optical monitor of claim 2, wherein said optical coupler comprises a multi-section optical coupler.

5. The optical monitor of claim 1, wherein said optical signal is filtered twice before the power is measured by said photodetector.

6. The optical monitor of claim 1, wherein said directing means comprises a mirror.

7. The optical monitor of claim 1, wherein said directing means comprises a Sagnac loop.

8. The optical monitor of claim 1, wherein said directing means also substantially eliminates any polarization dependence of the tapped optical signal.

9. The optical monitor of claim 8, wherein said directing means comprises a Faraday rotator mirror.

10. The optical monitor of claim 8, wherein said directing means comprises a quarter-wave plate.

11. The optical monitor of claim 1, further comprising a control unit for tuning said tunable filter across the band of the optical signal and recording the power measured by said photodetector as a function of the frequency of said tunable filter.

12. The optical monitor of claim 1, wherein said tunable filter comprises a plurality of coupled Mach-Zehnder Interferometer filters.

13. The optical monitor of claim 12, wherein each of said Mach-Zehnder Interferometer filters comprises at least one phase shifter.

14. The optical monitor of claim 1, wherein said tunable filter comprises seven coupled Mach-Zehnder Interferometer filters.

15. The optical monitor of claim 14, wherein said tunable filter comprises an exponential distribution of free-spectral range from 200 to 12800 GHz.

16. A method of optical monitoring, comprising:

a) filtering a tapped portion of an optical signal at a predetermined frequency;

b) substantially eliminating any polarization dependence of the tapped optical signal;

c) filtering again, the filtered optical signal;

d) determining the power of the filtered optical signal; and

e) repeating steps a) through d) for each frequency throughout the frequency band of the optical signal to determine an optical spectrum of the optical signal.

17. An optical monitor, comprising:

a tunable means for filtering a tapped portion of an optical signal at a predetermined frequency;

a means for reflecting the filtered optical signal back through the tunable means for filtering and the means for tapping; and

a means for measuring the power of said filtered optical signal.

18. The optical monitor of claim 17, further comprising a means for tapping a portion of the optical signal;

19. The optical monitor of claim 17, further comprising a means for substantially eliminating any polarization dependence of the tapped optical signal.

20. The optical monitor of claim 17, wherein said means for reflecting further substantially eliminates any polarization dependence of the tapped optical signal.

21. The optical monitor of claim 17, further comprising a means for scanning said tunable means across the band of the optical signal and for recording the power measured by said measuring means as a function of the frequency of said tunable means for filtering.